UNITED STATES
DEPARTMENT OF THE INTERIOR

DI-6

APPROVED DECEMBER 1941

Board 2 1964 ARCTIC
EXPEDITION F.S.
~~[illegible]~~
IN 1961 3 ft 10 Ad. 8 13.2

Section 8132
[illegible] Number of [illegible]
[illegible]

This section [illegible]
[illegible] about 1/8 mile S.
of the channel [illegible]
[illegible]
[illegible] and [illegible] [illegible]

Stones on small [illegible]
[illegible] [illegible]
[illegible] Section chips at 1/8 [illegible]
south, prob. [illegible] [illegible] app. 350 [illegible]
UNIT. [illegible] [illegible]

Cm

[illegible] [illegible] Fm.
[illegible]

1 230 ss. dirty, med. [illegible] them
mg. s.c. with light layed
wood. Frags; apparently
massive

2 100 [illegible] silt [illegible]
weather [illegible] m.g. s.c. ss
[illegible]

9/15/87

Calculation of elevation of

base of Sec. 8432 above base of Mbr I

Dip 7° S in small dome

Channel at white bluff on S. limb of dome

Distance [illegible] 2420 m

Azimuth 15° Dip 7° [illegible] 90°

Left Az. Dip: Az. [illegible] Dip 28°

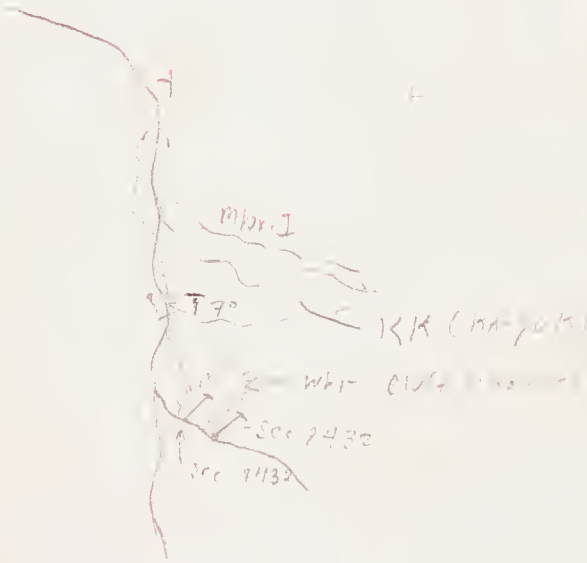
App. dip = 5°

Dist. base of Sec 8432

above [illegible] Mbr I

sin 5° x 2420 m = 298

≈ 300 m



med. gr. brownish grey,
quartzose w. tabular
& cuddle drift. Y. ledge
alt bands dark grey
brown and lt. grey.
Upper portion w. clasts
up to 5 cm composed
of [illegible] 55
w. lt. grey cement.
Basal contact down
cutting into unit 1.
Thickness = 0.1 mete
N. and 4 m south of
1. of s. [illegible]
THIS IS UNIT 3 OF SECTION

3 350 interbedded lignite
stringers w. dark grey
carbonaceous shale.
→ 330 above base
pollen §432d ←
Lignite interbeds
disrupted by permafrost.
[illegible]
beds [illegible]
[illegible]

4 205 Inoc. lignite
[illegible] 205 cm
thick lignite.

495

5	165	lt. brownish grey weathering, massive siltstone, ledge forming. Fines upward, transitional to unit 6
6	130	dark grey plastic mudstone, lt. brownish grey weathering.
7	140	Lignite, impure w. clay
8	495	Interbedded lt. grey siltstone w. carbonaceous ~~[illegible]~~ zones and thin seams of lignite. Some clay fragments, ~~[illegible]~~ zones ~~[illegible]~~ wood. Rare ledges of limestone cemented silt. Weathers lt. grey w. trace of flutings. 100' north large channel of lt. grey flutes, rest of this level.
9	25	25 cm. br. gray clay massive
10	340	Lignite forming [illegible]

		ledges.
11	290	~~[illegible] wood in base~~ dark grey carb. shale ~~[illegible]~~ ~~[illegible]~~ wood ~~[illegible]~~ ~~[illegible]~~ → 8432e pollen 20cm above base of unit ← permafrost at bottom of unit. Fissile shale → 8432f pollen sample from br. grey chippy mud stone above 30cm, sample from 40cm ← Unit weathers lt. grey w. flecked
12	245	Impure lignite w. lenses wood. At 245 next unit
13	145	Dark grey ± ssive carb. shale.
14	[illegible]	Mbd brownish grey v. fgsa cldty ss. weathers lt. grey, [illegible]

15	210	Brown massive mottled ss, vtgsa, dirty. mottled w. massive carb. blebs. Above 165 becomes sooty & fries upward to carb. clay
16	65	Lignite
17	360	Dark brownish grey massive mudstone, mottled w. brownish grey. At 235 [illegible] w. plant stems.
	Offset to spur 100 [illegible]	
16	235	Lignite
17	35	Carbonaceous & brown shale
18	20	Lignite
19	25	Dark grey carb. clayey shale [illegible]
20	505	[illegible]

		Clay Fe rance, th. [illegible] contains "Metazoan" fossils + cones. 8432a Concretions to 30cm thick. Conc. layer 10cm thick. Top occurs at 475.
21	130	Vfg dusty ss weathering lt gray. Becomes increasingly carbonaceous in lower 50cm.
22	260	Lignite
23	15	Gray shale
24	65	Indurated ss ledge, vfg, rippled drift bedded, ripple marked w. Crading a ?, Nutrine flora 8433b.
25	[illegible]	Fissile dark gray shale
26	[illegible]	[illegible] at 330 clay [illegible]

with fossil plants 30cm
thick 8432 c
Bergen Bay [illegible]
in [illegible] 20cm

8432 a + 2 [illegible]
[illegible] 430

[redacted]

7/5/14

[illegible] 4423

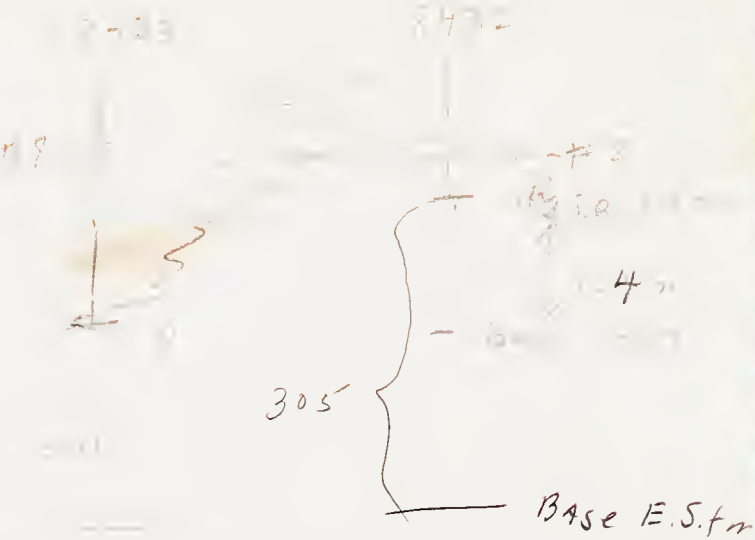
Section through white
[illegible] channel at
Canal

1	200	[illegible]
2	495	[illegible]
3	4630	[illegible]

4 4105

Top of yellow
sandy clay
sand

Current direction in 2
tabular sets is S by SE


4
305
Base E.S.fn

5	990	[illegible]
6	200	Lignite [illegible]
7	200	[illegible]
	02	[illegible]
	#2 § 8432 =	[illegible] TO S. This unit is equiv to unit # 2 of Sec. 8432 but industrial SS only in rare lenses by that time.

3/4/[illegible]
[illegible]

[illegible] Sac [illegible]

9 340 [illegible]

9 1/2 400 Light [illegible] 55
Y Brittle

10 530 Yellow [illegible]
[illegible]
[illegible]
Dur [illegible]
Many Clay [illegible]
Stone Cracks

[illegible] 2[illegible]

[illegible]

[illegible] TC STD
[illegible] 3 m
[illegible] 5 [illegible]
[illegible] Yellow
[illegible] 55
[illegible] 8432 g

7/4/84

Picked up at [illegible] ASG
[illegible] Flew to
Bay Ridge [illegible] South
Bay & Moore Valley

Found May I to attend
N alley in front of Sam South
H.S. Also at N. end of Wolf
Valley [illegible] Box II Sedan

May I seems to be a [illegible]
[illegible] unit. Brought a
large [illegible] of Central West
Missile

7/5/84

8434 ✓ Bay Fiord nose of Syncline
~~At~~ S of Irene Bay

Mbr. II E. S. Fm.
Pinned on AF A-16606-85

Metaseq.
Cercid.
Platan. Nob.
Magnolia ?

8435 Bay Fiord Nose of Syncline

Cercid. phyllum fruits in
Clay Fe stone
Some cercid. lvs.
And Meta sprays

w Conyphedon bone scrap

7/5/84

8436 Top of Mbr III about 50' below upper contact w/ Mbr 4. BAY Fiord S of Irene bay in Syncline

8436b McCasequoia Canes
Snails & Corals
Cercid. fruit

10 m below Mbr IV / III contact

8436a - 20' higher in an ~~Chan~~ Fe Cemented SS ~~to~~ above a grey Sand
Taxodium Pinnules

8436c 100' below 8436a

Small Hen & More Sculpture
[illegible] or Shell [illegible] been
[illegible]
[illegible]
[illegible] Style

7/5/84

8437 Mbr III North Prince of Wales Shoreline
S. of Irene Bay

Equisetum large
Betula

8439D 20 feet lower than 8437

lignitized wood w growth
rings Metasequoia
Plat
foliage at this level
Metaseq
Platanus reynoldsii

8437C Calcarenite w/ Ins Unit #7
cts.

Populus
Cercidiphyllum
Metaseq
Betula
Platanus
& New Platanus?

Bed markings
"Pimples" &
worms

Section
8437

Section starts near toe of
Spur about 1/4 mi from
√CT of its tributary
streams w/ the best
exposure.

Mbr III
Interval on h

Marls & siltsts, some coals
in suit intervals
separated by SS.

Unit	Thick	Des
		Dip 68°
1	HI 0 – 0.3 m 16.5 m	Marls, siltsts, thin lgs.
		Dip 59° S
2.	0.6 m	SS xbedded
3	20 + 0.5 m 34.2 m	As unit #1
4.	6.5 m	Yell tan calcareous
5	25 42.1 m	As unit #1 w/ SS lens sep. up to 0.4 m

8437 7/5/84

	Thickness	Lignite
6	1 H 1.7m	
7	4+ 0.3m 7m	As in unit 1
8	1 + 0.1 1.8m	X bedded calcarenite w roots vert Dip now 50%
9	13 - 0.3m 21.6m	Unit as at #1 ~~SS~~ indurated ss lens
10	1.4m	Ind ss (calcarenite vert roots) Dip now 42%
11	6 10.1	Unit as at #1 predom sand's 1 f/l 7m wide
12	9 H 15.2m	Shaley unit forms cliff of brown lh. Lower a mell
13	4 - 0.3m 6.4m	As #1
14	0.8m	SS ledge (calc.)
15	15 + 0.8m 26.1m	As at #12

16	2.4+ 0.3 m	As in #1
	3.7 m	UNIT a 7m wh
		rhythmically
		bedded sec. of
		mrls. ibdst
17	2.5 m	Inf. calcarenite
		w. lvs of Flora
8437 C →		#8437 C
		t worms
		some hall and
		yellow
		vertical roots
18	5.4 m	As in #16
	8.8 m	but w. 7m
		varied SS interb
		- clay. Ec. strm
19	9.8 m	Lignite
20	13 ft - 0.2 m	w. interbedded
		lignite
	22.1 m	& 13m SS interval
		has 7 sites
		Petrified wood
		40 base
		(Sampled)
		~ 8 ft
	Loc 8437 →	Resistant
		bed in SS

21 0.3 m 1md ss ledge
Fossil pl. imps
22 2m + 0.8m 25 in ft = [illegible]
4.2m
21 1.2M 1md ss ledge
Calcareous
Disrupted bedding
[illegible]
22 7 + 1.4 m Above this pt
13 m [illegible]
[illegible] ss [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
trans' to unit II
Dry [illegible]
clay [illegible] stones
w leaf imps
rarely
23 0.4 m [illegible]
ss ledge
24 2 HI [illegible]
3.4 m At 1 PI
Level of
[illegible]
25 3 AI Ssh 2 4I [illegible]
5 m [illegible]
X [illegible]

26

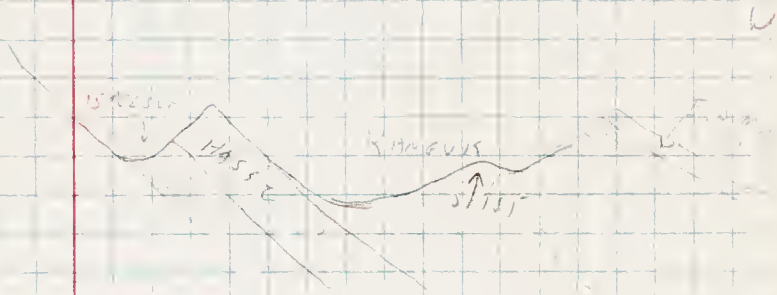
44.6 m

Sect. 8438

Base of E.S. Fm on
Fossil Forest River

Base is a classic
parallel bedded (Thnly)
pro delta sequence

Dx 30-35



Section starts in Kmrguk Fm
abt 2/3 of way to top of Kb
in a prominent ashy grey
siltst unit that forms a
low ridge.

Thickness — Descr. place

Kmrguk Fm.

431

		starts ⅔ way to top of fm.
2	224.5	Dk. gray laminated shale, poison sulfur smell, weathers dk. gray w. whitish efflorescence, some greenish g'a. (?) glauconite (?) intrlds in first 10 ft. (dip is 50° W). Bands of rusty greenish yellow weathering material at 225, cm. glauconite (?).
3	305	Unit becomes silty, mottled in places
4	135	Black shale
5	430	Mudstone, med. gray weathering dk. brownish gray color, some mottling, appears irregularly bedded laminated, laminations interrupted with mottling. Beds of siltstone appearing in upper portion.
6	285	Siltstone lens thickening to S. from 1.5 miles to 3 mi.

7	245	Mudstone, shale inter-beds, dk. gray to black, sulfur smell,
	Top of	Kenguk
1	1440	Member 1 of ESF. Interbedded shales, siltstones, ironstones w. minor sands, sands increasing to top, generally fine lenticular with burrowing into organic rich layers. Sulfur smell, several discrete layers of Fe nodules, 2-3 cm, 5 - 20 cm thick. Th. cykess [illegible] gastropod [illegible] increases upward. (Interp. Th. ss. grade [illegible] sea, not [illegible] [illegible] of E.S.F.)
2	825	Sand, Lgw, vfg ss. Above 200cm have clay Fe cemented sand ledges, clayey furrowed.
3	2680	Vfg ss, lt. yellow gray to yellow weathering. Abundant Fe cemented ledges with [illegible] burrows w. [illegible]

		rms, in greenish yellow
	→	sand → 8438 a sand
		for glauconite at 95cm
		(dip 37° W). Above
		495cm sand lt. gry to
		brownish gray weathering
		w. irregular curved
		ledges but in usual
		oxidized colors
4	330	Lt. gray to vfg lens, w.
		carbonaceous &
		brownish gray mudstone
		laminae, irregular but
		roughly parallel (PX 36,
		roll 2). Sequence capped
		by 3cm lignite (possibly
		represents back beach/
		swamp/ lagoonal into flow).
5	20	Lignite
6	450	Ss as unit 4.
7	30	Lignite
8	310	Ss as unit 4
9	470	Gray br. shale w. thin

		lt. gray and less at 70cm, thin sand stringers in shale of well cmtd fg. sands (possibly reworked wash over sands). → Roller at 340. 8438 b ←
10	380	Sand, yellow, orange & pinkish variegated, v. fg. clean w. white clay clasts in best portions, some ferrug. impregnated ledges
11	1815	Purple, fissile mudstone. Contacts of white 4 - are lenticular. Finning upward to a shale above 660cm.
12	30	Br. gray mudstone.
13	235	Ss. w. [illegible] white, pink, [illegible] to lt. 4.
14	80	Fissile dk. gray [illegible] shale.

15	120	Lignite
16	135	Ss. as unit 4. Basal contact down. cutty.
17	330	Coal & ss. interbedded
13	30	Dk. gray carb. shale, fissile.
14	195	Lignite
15	205	Ss., vfg. med. gray weathering friable w. shale laminae, dk. gray, increasing upward
16	175	Dk. brown sl. gray shale
17	610	Wh. friable vfg. clean, apparently leached, ss, indurated to qtzite
18	10	Purple gray siltstone, carb.
19	100	Lignite
20	70	Purple gray carb. ss
		Top 40cm weathers to yellowish gray plates

21	165	Hfg, [illegible] dark gray [illegible] fissiliferous [illegible] ss.
22	785	Fissile dark gray shale (90), interbedded with platy [illegible] lig. ss. (30) (dip 25°)
23	295	Partly covered [illegible] [illegible] [illegible] [illegible] Some thin lignites
24	150	Lignite w. pyrite [illegible] Stringers [illegible] [illegible] [illegible] [illegible]
25	165	Interval as unit 23 [illegible] digestage of [illegible] into [illegible] [illegible]

[illegible] Sec. [illegible]

2/6/84

20 8-139

Must give [illegible]

Photo 16728-97

Ian Lower Mbr IV

CLAY Fe stuff

Cercis

MELA

Cinkgo

Pterocarya & seed flora

[illegible]

A flora of Paleocene age?

[illegible] Bell [illegible]

also [illegible] w same

[illegible] affinities 55

of [illegible] as in Sec 6438

7/7/84
Cool & Clear
Temp 10°C

In Syncline on N. Shore of Fossil Bay S of Camp

Lignites appear to be a combination of AUTOCHTNOUS & drifted compounds

w. drift wood [illegible] abundant [illegible] the [illegible] in the coals

Nowhere in my [illegible] observations have I seen burned wood either in the coal or its chars in sediments

Cold In syncline N. Slope of Fossil Bay [illegible] Axis w. breccia.

Brian Richetts
Geological Survey of Canada
3303 - 33 St. NW
Calgary, T 2E 0L8

Coal source potential of Arctic

David MacIntyre

at G.S.C in Calgary

- Brian has ~~many~~ over 200 samples from E. S. in Strand Fiord

finds brown in E. S. section from mid Maastr to mid Paleocene.

Equates the 300 m shale mbr in the mid Paleocene at S. F. w/ probably the transgression mbr. III here at Bay Fiord

Claims that Princess Margaret Arch ~~had any role~~ was a positive feature during early to

7/7/84

middle Eocene Orogeny
notion that the sediment came
from the front & Transbaicalian
uplifts to the north.

Orogenic activity in C. Asia Hedin
also a factor in shuddering
sediment

Denies the claim by Meall that
the Jungar basin was
broken up into a number of
sub-basins, sediment pattern
not uniform over the majority
of the area

Kangalo ~~upon~~ is a transgressive
limit in sense of said in that
it occupied a runway at
time of major marine incursion
over land. = Manas in this
regard.

7/7/84

8441

ON PHOTO 16606-16

Hill at Scona next west
from Camp Hill

Morocut
Hamamelid lf.
Glyptostrobus
Pterospermites ?
Alnus ?
Chaetoptelea
Acer sp.
Betula sp.
Equisetum sp
Metasequoia
Cercidiphyllum sp
Platanus nobilis
Vinca sp
Platanus raynoldsii
(Juglans ?)

7/8/84

Helicopter [illegible] 50 ft

Temp 45°F

[illegible] wind

Helicopter Traverse

Map: S. E. Branch of Moore River

SW of Mt. Moore

Map II

Thirty [illegible] Chains

W

E

5/8/64

8442

[illegible]

[illegible]

8443

Mbr I

SS Coarse [illegible] though this was not evident until loc 8446 on eastern margin of [illegible] Valley was seen.

8444 - About 1 mile N. of 8443 on E. side of [illegible]

7/8/84

8445 South [illegible] Ave

First [illegible]

Photo A16606-69

Mr. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

At [illegible]

[illegible]

7/8/84
Clear, warm, no wind
mucho mosquitoes

$79° 32.5'N$; $80° 14.5'W$

F. S. [illegible]

F. S. Mbr I [illegible] C [illegible]
Angular uncont.
[illegible] 20° [illegible]
No Chrisnolm
Erickson
Christopher
[illegible]

Central Ellesmere
an island in [illegible]
[illegible]

Mbr I [illegible]
[illegible]
[illegible]
[illegible]

[illegible] Mbr II

[illegible] basal contact
w Dob

[illegible] lignite above
[illegible]

Channel w/ pet wood
w sulphide

This indicates that Hazenbury,
Hard, & Kangeh are not
present or not appear at the Central
Ellesmere highland. Central along
the l. side of more likely is
an unconformity not structural

7/8/14

8447 [illegible]

Lat 79° 47'N ; 82° 26'N

Contains some gneiss w/ lichen fragments

Photo A16676-79

7/8/84

8448 [illegible]

[illegible] wood collected from here.

Photo 16706-81

7/8/84

79° 7.5' N; 83° 20' W

Worm Traces on Bedding plane in Is.

Mbr III Mary reports she and Mac Found Crinoid columns & mollusks in Is. near here in 1973.
Manni Chand

Lat 79° 8' N; Long 83° 39' W

Nothon Photo A16676-177

7/9/84

Camp Day at Bay Field
Bob Scherk arrived at about 4:30 pm
on ASG w Doug McLeod
Pilot

7/10/84

Rain Day & attempted to move
to Lake Hazen but weather
impossible this.

7/11/84

Weather still socked in at Hazen
w/ snow starting in the early
afternoon. So we decided to
go to Haughton Astroblme.

Picked up by Doug McLeod in ASG
w/ a few stops at Sun Fiord
med Steward McKenzie animal
ethologist at Wild Mus Ottawa
(Army Sull robins - former
wildlife photographer) and
Darrel Stoll.
Arrived at Haughton Astroblem
at about 7:30

7/12/84

8451 In Haughton Astroblem Lake Bed

84-01 Dicerathere (Rhino) skeleton w Teeth
Higher of 2 loc.

0451

84-02 TRAGULID (Artiodactyl)
Upper decular skeletal
parts most Toes
~~fingers~~

8452 Birch leaf

In Lake Beds 1/2 mile
SW of 1984 camp
site.

July 13, 1984
Haughton Astroblème

Rained & windy all day

Visited by Haughton River

Geophysicists abt. 11 am
who brought warm fresh
baked Raisin oatmeal cookies
from their camp 2 miles away.

Spent much of morning brain-
storming on arctic as center
of perissodactyl evolution
& other ecological/adaptive
aspects of early Tertiary
biota.
Decided that high crowned
serratomorph teeth of early
perissos let them grind up
tough Arctic veg. especially
during winter when only
twigs & brs. were available.

Distinguished between
Animal groups originating
in Arctic (perissos)
& those merely radiating
in from elsewhere
(Coryphodont)

In the afternoon we prepared the rhinoceros Dicerotherium (mid-Miocene) & the Tragulid.

Rain continued temp. at 7 pm +5 °C

7/14/84

HO @ temp +4°C

Hughton Astrolene

CH/53 LAKE [illegible]
massive friable tan
dolomitic ~~[illegible]~~ silt
no [illegible] [illegible]
[illegible] [illegible]
[illegible] this is a
series of small [illegible]
S & E is here
[illegible] is
[illegible] lake sediments
at Fish Cone site

[illegible] not represent a
[illegible] [illegible]
[illegible] [illegible]
[illegible]

[illegible]

Haughton Resolution

8-4-54

Margin of [illegible] [illegible]
[illegible] [illegible] [illegible]
[illegible]

[illegible] 1-2 [illegible]

medium [illegible] [illegible]
& [illegible] [illegible]

→ Pellon sample 8-4-54

Lake [illegible] [illegible]

[illegible] [illegible] [illegible]
[illegible] [illegible] [illegible]

[illegible] [illegible] [illegible]
[illegible] [illegible]
[illegible]

Section	[illegible]	
		[illegible]
	[illegible]	[illegible]
		[illegible]
		[illegible]
		bottom [illegible]
		above the [illegible]
1	330 cm	[illegible] dump
		[illegible]
		very fine [illegible]
		or [illegible] sand stone
2	169 cm	very fine light [illegible]
		[illegible] 5A to A.
		[illegible] or [illegible] stone
		sample [illegible]
3	2-20 cm	[illegible] dk gray [illegible]
		angular to [illegible]
		[illegible]
		[illegible]
	Surface [illegible]	clots to 5 cm at top
		local contact irregular
		[illegible]
4	4[illegible] cm	Very fine sandstone
		or [illegible] angular
		[illegible] tan.
		[illegible] mixed [illegible]

Unit	Thickness	Description
Unit 4		3mm [illegible]
[illegible]		[illegible]
5	48 cm	Med. [illegible]
		[illegible]
		[illegible]
		[illegible]
6	35 cm	[illegible]
		[illegible]
		[illegible]
		[illegible]
7	70 cm	[illegible]
		[illegible]
		[illegible]
		[illegible]
		with clay laminae
		in lower half
		(5 mm thick)
8		[illegible]
		[illegible]
		[illegible]
		[illegible]
		[illegible] > 5 cm

Posit	Thickness	Description
Coal	70 cm	[illegible]
9	28 cm	[illegible]
10	50 cm	[illegible]
11	75 cm	[illegible]

12	50 cm	[illegible] gray [illegible]
		[illegible]
		[illegible] Sample [illegible]
13	3 cm	lt yellowish [illegible]
		silt [illegible]
14	32 cm	[illegible] middle [illegible]
		silt [illegible]
		[illegible] with [illegible]
		[illegible] 2-5 cm [illegible]
		with [illegible]
		[illegible]
	Possible [illegible] soil	[illegible]
		[illegible]
		yellow to red
15	145	lt [illegible]
		yellowish silt
		with [illegible]
		[illegible]
		[illegible]
		[illegible] 5 [illegible]
		lt yellow [illegible]
		[illegible]
		[illegible]
16	[illegible] surface of [illegible]	

Sec. 8455

First of unit 3
Shows no signs of water
transport. Coarsens upward
Represents a debris flow
Showing shapes of crater
still observable at start of
lake deposition.
Means lake started to
fill crater soon after
impact.
So will Miocene date
so Miocene fixes 2nd
date of impact at
least for Metric

Offset section 8455 d'

30 m N of 8455 to catch
additional beds at base
of original section

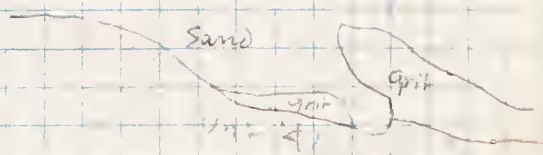
UNIT	Thickness	Description
		base of section ~ 1 meter above breccia
1	135	covered interval in lake beds

2 9 cm parallel laminated
very angular silt
yellowish brown

3 3 cm very strong clay
[illegible]

4 5 cm grayish brownish silt stone
parallel in
[illegible]

5 spit, [illegible]
1-8 [illegible]
[illegible] on [illegible]
1 2 m to the north
[illegible]
and [illegible] cutting
[illegible] off by [illegible]
[illegible]



6 [illegible]
spit in section
8455 (unit 4)

7/15/84
Temp +0.3°C 25 ⊕

8456 Haughton Astroblome

SITST w pods at
CLAY bearing twigs, branches
& possible roots
Samples of wood taken
for ident, looks like
Conifer wood

CLAY pods possibly root
masses that were carried
into lake

Marked on photo A16747-22

5-5 Section up

7/15/84
25 (+)
30°

8457 SECTION Type [illegible]

Starts at base of slope above slumped area
concealed rest of [illegible]

Unit	Thickness	Description
		base of section [illegible]
		[illegible] fm. [illegible]
		[illegible] of lt yellow gray siltstone probably equivalent to top of section 8455
		this from leveling over to previous section 8455
		as also color [illegible]
1	95 cm.	med yellow brown [illegible] SA clayey SS massive with small lens of gray clay and thicker lens of [illegible] [illegible]
2	136 cm	Lt tan color [illegible] w/ [illegible] massive, (mod. INTERBEDS)

added on interpretation date 3/4/88

3	100	yellowish-gray massive mudstone becoming brownish with limonite and limonite concretions towards top
4.	105	SA to A coarse silt lt tan brownish gray mud parallel laminae in places
5	95 cm	Mudstone yellowish gray & brown darker base
6	100 cm	SA to A coarse silt lt tan lt yellow tan slope
7	246 cm	mudstone and siltstone interbedded mudstone medium yellow brown siltstone lt yellow brown limonite mottles. the limonite crusts on slope which weathers yellowish tan

8	125 cm	1 tan siltstone SA to A Sample 8457 ii for [illegible] mass M tan weathering quartzose? should be examined N.B. typical of all siltstones in this section Reddish brown at basal 5 cm Some suggestion of parallel bedding at 1 cm intervals often by carb. smears in cut face
9	125 cm	pinkish brown to med. yellow gray brown laminae of to small [illegible] in a tan silt stained at top

10	35	Coarse siltstone lt. yellow gray with yellow streaks SA to R
11	158	med yellow brown mudstone weathering lt yellowish brown with limonite nodules Sun visible! limonite nodule layers occurring densely at 60 cm, 90 cm, and 150 cm
12	64 cm	laminated siltstone yellowish tan with abundant limonite nodules which form a distinctive layer, nodules increase in abundance more mudstone, towards top of section into 13
13		Wood [illegible] La. [illegible] [illegible] lt tan A-SA clean silt

13 cont.	200 cm	with lighter wood fragments, twigs, & [illegible] at major [illegible] in clay [illegible] [illegible] occasionally mudstone masses.
		becomes [illegible] at top
14	140 cm	orangish yellow silt with mudstone lens, decomposed more clean & [illegible] upwards where it is a fine [illegible] lens silt [illegible]
	→ TRACKLID level loc. 84-02	
	Ac. basin Rabbit	brown-red slaty concretion up to 5 cm thick v. fine sand layer at top at [illegible]
15	250 cm	lighter colored mudstone (med. brownish gray) and tan siltstone and scattered red-weathering [illegible] concretions

16	173 cm	tan [illegible] massive
17	290 cm	interbedded [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
18	265 cm	tan [illegible] [illegible] massive typical [illegible] (cliff SILTST.) [illegible] [illegible] [illegible]
	44 SECT.	
19	90 cm	[illegible] [illegible] [illegible] [illegible] [illegible] yellowish brown clumpy [illegible] [illegible] staining [illegible] and brown interbed [illegible]
20	70 cm	Siltstone with clay [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

21	123	[illegible]
	→ RHINO level	[illegible]
	a I 102 84 D-1	prominent [illegible] weathering slope [illegible] 30 much more [illegible] than within interbed 1-3 cm
22	[illegible]	[illegible]
23	[illegible]	[illegible]
	83	[illegible]
24	125	[illegible]
25	175	[illegible] massive limonite stained at base [illegible] thick rubble cap.

[illegible] 150 cm [illegible]

[illegible]

End Section 8457

32
10
888
050
158
150
100
025
32
36.32

total thickness

36.32 meters

4

7 5 0

7 0

2 8

INTERVALS IN TO Sec. 8457

Loc. 84-D4 Rhino.
Transition ~~into~~ in UNIT 21
of Sec. 8457.

Loc. 84-D2 Tragulid 45
630 cm. below BASE
of UNIT 18.

Pollen Sample 8458

From black carbonaceous 15
Alt 30 cm. thick
7.5 m. below top of
Bone sampled by
Pollen Sample at
[illegible]

Pollen Sample 4.75 m. below
Bright layer here

HI 168 Cm.

8459 Sand of Rhine State Hill
Abt 4 mi S of Gadsden

[illegible] Sample of [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

7/16/84
30 ⊕ SC
Temp +4°C

Haughton Astrobleme

E. of Rhinoceros Creek

Haughton Lake Beds
[illegible] toward central positive
area in crater

TAN vfg SS capping
terrace [illegible] rubbly-
looking "partly reworked"
[illegible]

846.0 Central Alluvium as mapped by
Robertson No Haughton Fm. This
[illegible] 50. is part of Paleozoic Section

846.1 [illegible]

[illegible]

[illegible]
[illegible]

[illegible] [illegible]
[illegible]
[illegible]
[illegible]
[illegible] SS SA [illegible]
[illegible] clasts to 1/2 cm

7/16/84

Haughton Ascent time

In Central mass
Arc platey is ~~on~~ in
rubble on shoulder at
8460 8460
And to top of central
mass rarely.

All rubble is highly angular
& shows no sign of being
fluvially transported
Therefore it was let down
onto this feature.

∴ Lake beds once higher than
central mass.
Found these thin bedded is to be paleolake
From central mass no
deep water gap is evident

∴ lake level lay at top
of central mass

∴ lake deep, sediment
to level of central mass
now disserted

This would explain lack of
scavenging by vents.

7/1/84

8460 (CONT'D.)

IAN A. MCDONALD COMMENTS THAT
IN SOME OF THE SEAS
PRESENT IN SPECIMEN AS THEY
WERE THE BAY NEXT
DOOR WAS LARGE AND
IS RADIALLY SMALL LARGE

STREAKS WERE ALSO HAVE BEEN
SMALL, MOSTLY DIRECTED
AWAY FROM UPTURNED MARGIN
OF CRATER RIM.

- PALEOZOIC PENETRATION INTO
WHICH CRATER IS PLACED
WAS UPLIFTED IN JUD OR
PRE-JUD

- PLATEAU LAVA SH
IS PALEOZOIC PUT LAVA
BELL

8461 IN THE SUBTOTAL
EXPLAIN THE REASON
THAT DATA WERE COMMENTS
ON ACTUAL
PRESENCE OF THE
POSSIBLE ACCIDENT

7/16/84

Dinner at Haughton River Camp
Trip made by — Honda
1 bride

7/18/84

Haughton to Lake Hazen.

Packed camp at Haughton and were picked up at 3:30 by Dunk (Richard D. Duncan) in NAN.
Flew low over Collin Archer Peninsula, Graham Island and the shores of ~~the~~ eastern Axel Heiberg and to Eureka. Dunc told fabulous Arctic stories chided me about following his course on an air navigation chart once saying that he just gets lucky sometimes in locating himself.
Mosquitoes bad at Eureka while we refueled.
Flew up N. west side of Blackstone Bay to Greely. Found skin from the head of Greely across the pass to the Lake Hazen drainage. Dunk flew just above the ground and close to the cliffs.

Arrived at "Amber Point" camp at 9:00. Dunk lifted off then came in low on a starboard run and made a steep turn on leaving.
Mosquitoes also bad.

7/19/84

846 2

[illegible]

[illegible]

846 2 a. Coal sample from
6-4 in above roof
coal seam [illegible]

846 2 b. Coal sample
roof bituminous
non weak

[illegible]

[redacted]

7/19/54

LAKE HAZEN

8464 Osmunda site

Coll. Mr. Dauser
M. Schaal

This is combined w/ Brown Butte site in the first collection
Are forsaken in an Osmunda an Equisetum
should be renumbered 8465 for Brown Butte!!

7/20/84

E 40 ¢, 70 ¢
100 C

LAKE HAZEN

6465 BROWN BUTTE

CLAY & STONE associated w/
a lignitic interval.
Exposure partially tunnelfro

Cercidiphyllum seeds
on elongate rachises
Acer (silver maple group)
METASEQUOIA
Glyptostrobus cryptomerioid
Thelypteris dalangsii
Langetia n. gen. shown to be
Pteridium P. CAYNOLDSII
Batula ?

7/21/84

8466 3 miles N from L. Hazen on Gilman River

Fossil lvs in silty float

Glyptostrobus
Cercidiphyllum
? Alder
? Acer
Menispermaceae

Meat cache on small lake on west side of Lake Hazen

Squared off log with
[illegible] stick sign
[illegible]
[illegible]
sign made by drying
flat sides apart
[illegible] symmetrical
[illegible] suspect

7/12/84

8467 Mills Site 2

E.S. Sp. of Coals
& Shales w. Cave Stone
Overburden [illegible]

Must [illegible] w/
Tuna Fm.

8467 a From [illegible]
[illegible] 120' [illegible]

8467 a is 30' above
good [illegible]
Coal

8467 b Coal Sample
from coal 30' below
a

8467 c Plat. nobilis
& Acer sp.

7/22/82

8468 LAKE HAZEN

Podler Samp

8468

20 cm

20' Below 1 metre thick coal

w amber

in a medium grey fissile shale

Coal = bituminous

Wells Sec 1

7/22/84

8469 [illegible]

[illegible]

8469 a.

Grey [illegible] 6" [illegible]
[illegible] in [illegible]
[illegible] SS & CAPS [illegible].

[illegible] in [illegible]
[illegible]
[illegible]

Commercial [illegible]
[illegible]

[illegible]

8469 b [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

7/22/84

8470 St. Boulder Hills

8470 a Pallets
Dark gray ~~[illegible]~~
Medium
[illegible]
[illegible] X-brace
[illegible]
[illegible]
[illegible]
[illegible]

7/22/84

8471 Turnabout

8471a Clay Fr stwc 10m above
pollen site w
Equisetum
Plat Metasequoia
Cercid
Alnus x Nuphar comp.

8471b Pollen sample

D. Grey Clay St. overlying
platey bitum coal
35m w amber opp
30 cm thick

~~2nd~~
Ca. 25 m above Tumna Fm

2472

Turnabout River

[illegible] E.S. [illegible] 65

Pollen sample

[illegible]

[illegible]

[illegible]

[illegible]

2472 b leaves
[illegible]

7/20/84

87/23

[illegible]

[illegible] Shady Shawl [illegible]
[illegible] Cash [illegible]
[illegible] Cashier
[illegible]

[illegible]

Grain-size Scales

By Roy L. Ingram, University of North Carolina

GRAIN-SIZE SCALE USED BY AMERICAN GEOLOGISTS

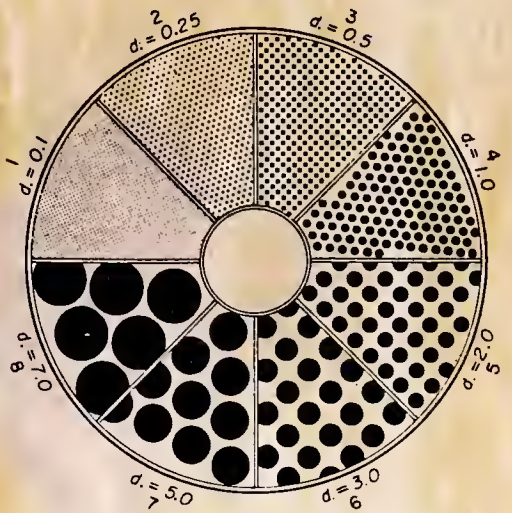
Modified Wentworth Scale — after Lane, et al., 1947, Trans. American Geophysical Union, v. 28, p. 936-938

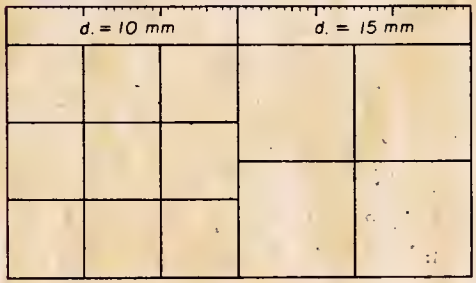
phi	mm	GRADE LIMITS mm	GRADE LIMITS inches	U.S. Standard Sieve Series	GRADE NAME		
−12	4096		161.3				
−11	2048		80.6		very large		
−10	1024		40.3		large	Boulders	
−9	512		20.2		medium		
−8	256		10.1		small		
−7	128		5.0		large	Cobbles	
−6	64		2.52	63 mm	small		GRAVEL
−5	32		1.26	31.5 mm	very coarse		
−4	16		0.63	16 mm	coarse		
−3	8		0.32	8 mm	medium	Pebbles	
−2	4		0.16	No. 5	fine		
−1	2		0.08	No. 10	very fine		
0	1		0.04	No. 18	very coarse		
+1	1/2	0.500		No. 35	coarse		
+2	1/4	0.250		No. 60	medium	Sand	SAND
+3	1/8	0.125		No. 120	fine		
+4	1/16	0.062		No. 230	very fine		
+5	1/32	0.031			coarse		
+6	1/64	0.016			medium	Silt	
+7	1/128	0.008			fine		
+8	1/256	0.004			very fine		MUD
+9	1/512	0.002			coarse		
+10	1/1024	0.001			medium	Clay size	
+11	1/2048	0.0005			fine		
+12	1/4096	0.00025			very fine		

Graph for Determining the Size of Sedimentary Particles

by the Data Sheet Committee, aided by George V. Chilingar

DARK PARTICLES





Place sand grains or rock particles in the central part of the circle. Compare the size of the particles with those on the graph with the aid of a magnifying glass. Record the corresponding number (1, 2, 3, 4, 5, 6, 7, 8) in notebook. For samples with particles of varying sizes, record the most common size first.